HALE ENERGY LIMITED

Year 6 Final Annual Report

25 February 2011 – 24 February 2012

ILLOGWA 1:250,000 MAP SHEET

EL24765

Distribution: - NT Department of Resources/ NTGS, Darwin
- Hale Energy Limited (Keswick SA)

Compiled & revised by D Adams April 2012
SUMMARY
Hale Energy Limited a wholly owned subsidiary of Thor Mining PLC is the holder of four granted exploration licenses, EL24734, EL24735, EL24736, in the Harts Range area on the Illogwa 1:250,000 map sheet SF53-15 in the Northern Territory (figure 1).

Regional uranium exploration was conducted over the Harts Range uranium tenements in 1992 and 1995 by PNC Exploration (Australia) Pty Ltd. The implementation of regional reconnaissance sampling of the area by PNC, lead to the discovery of significant uranium mineralisation, which was later followed up by an extensive regional assessment program.

Harfort Nominees Pty Ltd a wholly owned subsidiary of Batavia Mining Limited acquired the Harts Range tenements in 2005. In January 25th 2006 Harfort Nominees Pty Ltd was transferred to Hale Energy Ltd and holds a 100% interest in all 3 tenements covered in this report.

Exploration activities during 2007(Year 2) included detailed rock chip sampling, mapping and soil sampling at the Daicos, Haddock and Indiana prospects. All three prospects exhibit highly anomalous Uranium assays. The Daicos prospect also returned highly anomalous REE assays from pegmatites in the area.

Reconnaissance RC drilling was planned for 2008(Year 3) on the Daicos, Haddock and Indiana prospects however delays with completing clearance work on the prospects combined with the Global Financial Crisis (GFC) of late 2008 resulted in the cancellation of drilling activities until further notice.

Discussions with a prospective JV partner are in progress with a view to advancing exploration activity on the EM anomalies/conductors indentified from the recent helicopter EM survey completed on the southern side of the ranges over EL24735. Numerous EM conductors have been identified from interpretation of the data by Montana GIS which are thought to represent base metal sulphide mineralisation associated with amphibolites etc at less than 100m vertical depth.
1.0 INTRODUCTION

This report covers the Year 4 exploration activities completed by Hale Energy Limited on the Harts Range Tenements including; EL24734, EL24735, EL24736, EL24765 for the period 25 February 2011 to 24 February 2012.

2.0 LOCATION AND ACCESS

The Harts Range tenements are located in the Harts Range area 150km east-northeast of Alice Springs and 50km east of the Harts Range settlement (Figure 1). The tenement group consists of four tenements with a total area of approximately 206 km². Access is gained by 4WD vehicles from either north along the Plenty Highway via station tracks or south along the Ross Highway via the Arltunga Tourist Drive (Figure 1).
Figure 1: Harts Range Tenements on 1:250,000 Topographical base
3.0 HARTS RANGE GEOLOGY

The project area covers high grade metamorphic rocks of the Proterozoic Harts Range Complex, which are situated in the south-eastern zone of the central Australian Arunta block, in the Entia Domal Structure (Figure 2). The Entia Gneiss (Harts Range Group) forms the core of the Entia Dome, consisting of acid muscovite biotite gneiss overlain by tonalitic quartz/feldspathic gneiss. Granite intrusions form smaller domes within the central structure. Metamorphosed gabbroic and ultramafic bodies are also present within the gneisses. The stratigraphy has been dislocated by numerous faults and shear zones.

Figure 2: The Harts Range project showing the original tenement holding and the distinct styles of uranium mineralisation outlined by PNC Exploration.
4.0 PREVIOUS EXPLORATION

The tenement area has been covered by modern radiometric and magnetic airborne surveys. The first, in 1993, was over the southern portions of the area. It was flown for PNC Exploration (Australia) Pty Ltd (PNC) at a 200m line-spacing. The second, in 1997, was over the remaining northern portion. It was flown for the NTGS at a 400m line-spacing. The surveys identified three clusters of radiometric anomalies within the tenements. The largest clusters were located within the Entia Gneiss, in the southwest and south of the Entia Dome. The third cluster, marginal to the dome, is spatially associated with a zone of northwest orientated shears.

Exploration for uranium was conducted over the area between 1992 and 1995 by PNC, which carried out regional reconnaissance sampling and discovered occurrences of uranium mineralisation in a number of locations, which were followed-up by prospect scale mapping and sampling. Although some of the occurrences contained high-grade mineralisation, none were of sufficient size to warrant drill-testing. PNC reported four separate types of uranium mineralisation, based on mineralogy:

- **Uraninite-type**: Uraninite occurring as mm to cm sized crystals, crystalline aggregates, or nodules. The mineralisation is associated with felsic phases in amphibolite and gneiss. At the Yambla Prospect the mineralisation is within quartz veining in an altered fault zone. At the Ryoma Prospect it is associated with haematite-altered fractures within gneiss. Grab samples from this prospect gave analyses of up to 8.5% U.

- **Pegmatite Type**: Uranium bearing rare earth oxide minerals within or immediately adjacent to a suite of pegmatites. At the SNAF Prospect, and the latest rock chip sample site for Mt Mary, on EL24734, grab samples from the contact zone between pegmatite and gneiss produced analyses to 0.26% U. At the Kelly Prospect parts of the contact between a 3km long pegmatite and surrounding altered amphibolite is anomalous in uranium.

- **Epidosite Type**: Sub-microscopic uraninite and uriniferous allanite grains occur in veinlets and vugs, on epidote grains, and in quartz-apatite-sulphide pockets. The mineralisation is associated with epidote and epidote-garnet metasomatic alteration in shear and fault zones.

- **Retrogressed Type**: Finely disseminated uranium mineralisation associated with clay-silica alteration along faults. A total of 58 open file reports have been acquired and compiled covering all or part of the Harts Range tenements.
5.0 NATIVE TITLE AND SITE CLEARANCE

The Native Title Agreement for all tenements is based on the premise that Hale Energy Ltd is;

- Not to file and register a Native Title Application nor lodge objections in the National Native Title Tribunal to the use of the “expected procedures” in the grant of the six exploration licences; and;

- at the completion of any airborne and handheld radiometric surveys to seek your agreement that you will notify the Central Lands Council (CLC) of the specific areas where you intend to undertake onground disturbing exploration activities such as drilling, so that we can organise clearances of any cultural and heritage sites. This will ultimately provide you with the scared site clearances you will require under the Northern Territory Aboriginal Sacred Site Act.

The proposal effectively divides the exploration program into two phases. The first phase of work does not involve ground disturbing activities and does not involve native title holders and does not interfere with their legal rights. Further exploration work involving ground disturbing activities on the tenements will involve the Native Title holders seeking to protect their cultural interests in the relevant area. In this event The CLC will provide a simple agreement covering the work program clearance.

The CLC were contracted to commence clearance work during 2008 on EL24734 and EL24736 covering the Indiana, Daicos and Haddock prospects. The work involved field inspection of the sites with traditional owners to obtain clearance for reconnaissance drilling to commence. Numerous delays by the CLC to complete the clearance work with traditional owners resulted in only a third of the clearance work being completed. The area covering the proposed drilling at the Indiana Prospect is the only area to have clearance work completed on it to date. The GFC of late 2008 resulted in all drilling activities being suspended until further notice.

6.0 YEAR 4 EXPLORATION EXPENDITURE

Harts Range Tenement Exploration Expenditures for next year are nil due to Hale Energy surrendering all Harts Range EL’s.

EL24765

14.0 LOCATION AND ACCESS

Exploration License 24765 was reduced in size to 17 SBKS blocks with a total area of 53.55 km$^2$. It is situated approximately 265 km north east of Alice Springs, with access gained from the Stuart Highway and via the Plenty Highway (Figure 1).
15.0 GEOLOGY

The project area lies on the southern margin of the Entia Dome, joined to EL24736 in the north (Figure 3). The Bruna Gneiss and the Brady Gneiss form the west and central part of the Exploration License area. The Bruna Gneiss is classified as porphyroblastic feldspar gneiss, mylonitic and biotite rich in part. The Brady Gneiss is composed of calc-silicate rock containing clinzoisite, epidote, hornblende, clinopyroxene quartz and feldspar with minor garnet-biotitemuscovite schist. The Entia Gneiss (Harts Range Group) forms the eastern part of the Exploration License area. These rocks consist of acid muscovite biotite gneiss overlain by tonalitic quartzfeldspathic gneiss.

The western zone is dominated by the Mount Amphibolite Member which shows well developed compositional layering with subordinate intercalated garnet-biotite-quartz gneiss.

![Figure 3: EL24765 Geology Map showing PNC prospects and more recent Hale Energy rock chip sample locations.](image)

16.0 PREVIOUS EXPLORATION

The Placer uranium anomaly is located on the east edge of the Exploration License (Figure 3). A 200 x 150 m grid was constructed to investigate the 1,000 cps anomaly discovered during exploration in 1995. The anomaly is located over a partly dilatant; retrogressed, east-west fault, which cuts the layered felsic and mafic Entia Gneiss. Sporadic zeolite veining marks the dilatant segments of the fault zone, else where the fault is marked by non-dilatant fracturing. Grab soil sampling produced assays of 140-160 ppm U and 5,400-6,200 ppm P. Alteration (silicified zeolite) was traced over 100 m.
A single backhoe trench was excavated which exposed a well defined fault zone about 2 m wide and inclined steeply towards the south. Little crystalline zeolite was visible and the fault material was dominated by siliceous fault breccia. Green nontronite clay alteration was present at the margins of the faulted material. Only spotty radiometric anomalies are present on the trench walls associated with siliceous rubble (100 -500 cps). Channel sampling revealed uranium – phosphorous association, indicating uraniferous apatite to be the likely uranium host phase. A total of 22 channels were collected with the best assay return at 0.5 m of 260 ppm U.

Abundant elevated uranium bearing rock chips throughout the tenement are closely associated with faulting. A major faulted zone striking N-S in the eastern portion of the EL hosts highly anomalous copper (13% Cu) nickel (1,310 ppm Ni) and cobalt (0.25% Co) rock chips. No follow up exploration has been conducted over these anomalous areas.

The Culay copper occurrence was investigated in 1994 following the discovery of secondary copper mineralisation in 1993 (refer to Figure 3). Some features of the mineralisation exposed in the previous trenching suggest a cross cutting structure and associated biotitisation and calc-silicate alteration of the wall rocks. The single trench was excavated over an outcropping layer of quartz-feldspar-garnet-biotite gneiss, exhibiting malachite smears where a grab sample returned a 1,800 ppb Au assay. The trenching showed no garnet-biotite gneiss, despite the mineralised rock type outcropping a few meters north and south of the trench. Best copper assays from channel sampling returned 0.9-5.35% Cu over 50 centimeters. Only minute traces of malachite smear were visible in the northern trench wall. There were no radiometric anomalies in the trench.

In 1993 at the Goanna prospect (Figure 3) a grid measuring 200 x 200 m (pegs at 25m spacing) was constructed to cover a pegmatite quartz vein containing scattered fragments of U-Nb-Ta minerals. The vein was intruded along an E-W fault showing dextral offset. Two trenches were excavated, with the western trench sited where fragments of radioactive minerals were previously discovered. Only pegmatite and quartz veining was exposed with no radiometric anomalies. The trenching encountered a 2,500 cps radio active anomaly with U-pyrochlore in a narrow biotite filled fault. Channel sampling confirmed the U-Nb-Ta-Y mineralisation. Detailed ground work and ground geophysics failed to locate any further significant features.

The Horse area (western portion of EL, Figure 3) was discovered by follow-up of numerous uranium channel anomalies. Surface mapping outlined units comprising interleaved quartzofeldspathic and para-amphibolite layers of the Entia Gneiss. The prospect is located on a broad, open fold structure with a NW trending axial plane. Regional quartz-pegmatite dykes cuts all the units, resulting in patchy epidosite along the margins of the pegmatite dykes hosting sporadic uranium anomalism. A backhoe trench was excavated over the epidosite anomaly located in 1993 (440-510 ppm U).

The trench exposed a six meter wide zone of altered felsic gneiss. Minor uranium anomalism was encountered with assays returning 95 ppm U and 7-220 ppm Y. Other uranium prospects in the area include the Blizzard 1 and 2 prospects (Figure 3). The Blizzard 1 prospect (550 cps) is a garnet contaminated pegmatoid (280 ppm U, 1000 ppm Nb) in epidotised mylonite (53 ppm, 4, 970 ppm Ti) with weak uranium anomalism over 25 m².

The Blizzard 2 prospect (1,000 cps) is hosted in pegmatoid with several hotspots over 10 m², with assays of 590 ppm U.

The Zephyr prospects (Zephyr 1-3, refer to Figure 3) are located 1.5 km west of the Pony
prospect, within the layered Entia Gneiss. Radiometric anomalies at Zephyr is of two types; uraniferous alunite hosted by a pegmatite dyke and uraniferous epidosite hosted by a stratiform calc silicate layer.

Radiometric anomalies occur as clusters centered on lensoidal epidote dominated pods within the ‘target stratum’. The pod designated “Zephyr 3” measures 20 x 5 m on the surface and is continuously anomalous over this area. The pod designated “Zephyr 2” is larger, around 30 x 5m on the surface. Two trenches were completed over Zephyr 2 and 3. The uranium bearing horizon proved to be lithic with problems encountered during channel sampling. A total of 13 channel samples were taken from both trenches, with the best channel sample interval resulting in an intersection of 2 m @ 285 ppm U. Best assays from grab samples are 390-480 ppm U and 9-25 ppm Th. The true width of the uraniferous horizon in Zephyr 2 is 1.7 m and 1.3 m in Zephyr 3. Both prospects have been covered by ground spectrometer and magnetic surveys at 10x12.5 and 10x25m patterns respectively.

White Mountain prospect is a low order uranium anomaly associated with garnet bearing pegmatites dykes. The prospect comprises an east west pegmatite dyke system located approximately 2 km from Mount George. The pegmatites intrude the felsic Entia Gneiss with some associated interlayered amphibolite. The large pegmatite (800 x 100 m) forms the crest of White Mountain and contains numerous low order hotspots associated with garnet contamination within the pegmatite and epidote alteration in the wall rocks. Maximum recorded counts were 800 cps, with assays ranging from 35-450 ppm U, 50-200 ppm Zr-REE's.

Surface sampling in 1993 gave assay results in the order of 1,900 ppm U (known as the Garnet prospect, refer to Figure 7). A detailed grid was established at a scale of 1:1000 to map to confirm the nature and orientation of the structure hosting the pegmatite and biotite-garnet alteration associated with the U-Y-Nb-Zr mineralisation. The main mineralisation seen at Garnet occurs at the western termination of the cross cutting pegmatite. The pegmatite terminates in a 6m wide amphibolite layers. Minor anomalies have been detected along the margins of the pegmatite. The mineralisation occurs where garnet contamination of the pegmatite has taken place. The mineralisation is probably due to the development of hydrothermal metasomatic fluids that have come through the fractured pegmatite and reacted with adjoining, iron rich amphibolite producing biotite and spessartine garnet, at the same time attracting any uranium which may be present in fluids. The smaller anomalies also occur on the amphibolite/pegmatite contact.

One trench was sited on a radiometric anomaly located at the margin of a pegmatite where a large megacryst of garnet outcrops. The strongest radioactivity occurs where the pegmatite has been more extensively altered to garnet. Assays returned ranged between 18-2,900 ppm U, 100-4,000 ppm Y and 100-2,600 ppm Nb. Garnet contaminated pegmatite produced the highest assays while garnet-quartz-biotite alternation gave lower grade.

A detailed ground spectrometric survey over the Garnet pegmatite delineated a linear uranium anomaly along the northern (footwall) margin of the pegmatite. Rock chip sampling of the ‘Garnet’, and ‘Ant’ prospects was conducted by Hale Energy Limited in Dec 2006. The Ant composite sample HR 19 was taken in an anomalous zone with silica-epidote veining but returned a low uranium content of 34.4ppm. The Garnet samples were taken in an old trench (garnet rich rock skarn rafts in pegmatite), and returned u values of 1700ppm U (HR10) and 2600ppm U content (HR17).
Compilation of all available open file data was carried out during year 2.

The year 3 exploration included additional compilation of all known open file reports and review of all previous data. Location of several open file prospects in the field has proved difficult and in some cases errors in excess of 200m have been noted.

17.0 YEAR 6 EXPLORATION
No work has been undertaken during the period.